# Over-the-counter drugs and prescribing in general practice

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*SUMMARY*

***Background.*** *Both the government and the pharmaceutical industry are interested in increasing the use of over-the-counter (OTC) medicines. The reaction on the part of general practitioners is more circumspect.*

***Aim.*** *To investigate whether fundholding or dispensing status and patient exemption from, or prepayment of prescription charges influence the behaviour of general practitioners with respect to prescribing preparations otherwise available OTC.*

***Method.*** *Regression analysis of data for all 105 Lincolnshire practices for the fiscal year 1993–94, using the number of items prescribed by the practice that were also available OTC as the outcome variable. Comparison of Audit Commission Thematic Analysis of Prescribing (ACTAP) data for fundholders' and non-fundholders' OTC prescribing in the same year.*

***Results.*** *The prescription of medicines otherwise available OTC is less likely when the practice is fundholding and more likely when the practice has dispensing status. Prescription of such medicines also increases as the proportion of patients exempt from, or having prepaid prescription charges increases.*

*Keywords: over-the-counter medicines; prescribing behaviour.*

## Introduction

SELF-MEDICATION by means of the purchase of over-the-counter (OTC) preparations is, and always has been common for a wide variety of minor ailments, such as headaches, colds and indigestion. Relative costs and convenience appear to be major factors in determining whether patients themselves opt for, on the one hand, a visit to their general practitioner (GP) to obtain a prescription or, on the other, over-the-counter purchase from a pharmacy.[1] In 1994, the value of the OTC pharmaceutical market in the UK amounted to around £1270 million or 23% of the total sales of the industry. Of this expenditure, 41% comprised purchases of medicines for the relief of pain, skin conditions, colds and coughs.[2,3] It is evident that the pharmaceutical industry sees OTC medicine as a potential growth area for the future, as the market has obvious attractions. Price and advertising controls are typically lenient in comparison with those pertaining to prescription medicines, and market expansion is not constrained by the financial restrictions imposed upon the growth of public sector health care.[4]

The possibilities of OTC market expansion in the United Kingdom depend, in large part, on the responses of the National Health Service (NHS) towards OTC preparations. The government appears to favour the continued growth of OTC medicine, ostensibly on the grounds that consumer choice is thereby extended. To this end, it has both sanctioned general practitioners' recommendations of OTC medications in place of prescribed medicines, and increased the rate of reclassification of drugs from 'prescription only' to OTC status.[5] The response on the part of GPs, however, has been more equivocal. While being broadly supportive of the role of community pharmacists in retailing OTC medicines,[6,7] concern has been expressed on specific issues. Some GPs, for example, have questioned whether recommending OTC medicines in place of writing a prescription is actually consistent with their terms of service. The position of legal liability in cases of adverse reactions remains unclear, and there are fears that the wider use of OTC drugs will increase the likelihood of seriously ill patients delaying consultations. On a more positive note, it is also recognized that recommending OTC medicine offers opportunities both for savings on the NHS medicines budget and for giving patients responsibility for their own health and health care.[8]

To date, the extent to which GP attitudes towards OTC medicines translates into consequences for prescribing behaviour has not been examined empirically. In this paper, we analyse the prescribing behaviour of general practices in Lincolnshire, with a view to testing certain hypotheses related to OTC prescribing that have been suggested in the literature.

## Method

A multiple regression analysis was performed on data obtained for all the 105 practices in Lincolnshire for the financial year 1993–94 to establish support for the assertion that the possession of certain practice and patient characteristics is likely to influence the extent to which drugs, otherwise available OTC, are prescribed. The outcome variable was the number of items prescribed that were also available OTC per 1000 patients. The potential explanatory variables for the regression analysis were selected on the following basis.

It has been suggested that the prescription of drugs also available as OTC medicines might be more probable than recommendation to purchase when the patient is exempt from prescription charges.[9] Prescription to charge-exempt patients entails them incurring no costs, although patient costs would naturally be incurred with OTC purchase. Prescription rather than recommendation would also increase the probability that the medication is actually obtained. If GPs actually do take patient costs and compliance into account, the tendency to prescribe OTC medicines should be related to the prevalence of exemptions in the practice list. To test this hypothesis, we included variables pertaining to two types of exempt patient. First, the proportion of patients in the GPs' lists aged 65 years and above stands as a proxy for entitlements to exemption on the grounds of having reached pensionable age. Secondly, we take the practice-specific rate of unemployment to represent a proxy for exemptions resulting from the receipt of social security benefits.

From the point of view of this patient–cost argument, a third group of individuals is also of interest, namely those who have purchased prescription prepayment certificates. Although such patients do incur a personal cost, the economic implication of the GP's prescribing decision is actually similar to that in the

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true exemption cases above. This is because the purchase of the certificate represents a sunk cost to the patient, a cost that is invariant to the number of items subsequently consumed. As with exemptions, therefore, the choice facing the GP when confronted with a patient holding a prepayment certificate is prescription (at no additional cost to the patient) or recommendation to purchase (at some potential additional cost). GPs might, therefore, be expected to behave towards patients holding certificates in much the same way as they behave towards exempt patients, although we might add the rider that GPs could feel that, having prepaid, certificate holders are, in some sense, 'even more entitled' to a prescription. Accordingly, we included the proportion of the practice list holding prepayment certificates as a potential explanatory variable. If our behavioural hypotheses are correct, we should expect the regression coefficients on this and the two exemption variables to be significant and with a positive sign.

In rural counties, such as Lincolnshire, many practices are accorded 'dispensing' status. Owing to the low density of independent pharmacies, and therefore the inaccessibility of pharmacies to patients, practices with dispensing status are permitted to dispense their own prescriptions.[10] Previous research has shown that practices with dispensing status have higher prescribing costs and prescribe more items than non-dispensing practices. It has been suggested that a financial incentive — the receipt of dispensing fees and allowances — contributes to an explanation of such behaviour.[11] Accordingly, we included a dummy variable for dispensing status, hypothesizing that, for three reasons, dispensing practices would prescribe more items otherwise available OTC in comparison with non-dispensing practices. First, if we accept the general argument that dispensing practices prescribe at a higher rate than non-dispensers owing to financial incentives, then there would appear reasonable grounds for believing the argument to apply equally in the specific case of OTC medicines. Secondly, dispensing GPs are not permitted to sell OTC preparations to their patients and would therefore only realize a financial gain if they prescribed. Thirdly, dispensing GPs might feel that, owing to the low density of pharmacies in their area, the prescription of OTC medicines would be more convenient to patients than recommendation to purchase.

A dummy variable for fundholding status was included in the regression for two reasons. First, survey evidence has suggested that GP fundholders are better disposed than their non-fundholding counterparts towards OTC medicines, in the sense that they appear to favour a wider range of drugs being made available from pharmacies.[7] Secondly, they have also been shown to be relatively 'cost conscious', in that they have been more successful than non-fundholders in meeting prescribing budget targets.[12] To complement the regression results with respect to fundholding, the Audit Commission Thematic Analysis of Prescribing (ACTAP) data set for 1993–94 was obtained, which provided practice-specific information on expenditure on the range of prescribed drugs also available as OTC. These data are expressed per 1000 Age, Sex and Temporary Resident Originated Prescribing Units (ASTRO-PUs), i.e. expenditures are adjusted for the age, sex and temporary resident composition of the practice lists.[13] These data were used to undertake a comparison of fundholders' and non-fundholders' mean prescribing costs by drug expenditure area.

## Results

The mean number of OTC items prescribed per 1000 patients for our sample was 2.33 (SD = 0.62). Table 1 presents descriptive statistics for the explanatory variables and the results of the multiple regression analysis. It should be noted first, that fundholders prescribe significantly fewer items per 1000 patients for which OTC substitutes exist. Secondly, a higher preponderance of patients characterized by prepayment of, or exemption from prescription charges increases the number of prescribed items for which OTC substitutes are available. Thirdly, the coefficient associated with the dispensing status variable is significant and positive, i.e. dispensing status increases the prescription of preparations for which OTC substitutes are available. During the development of the regression model, more complex formulations were tested, which included all pairwise permutations of interactions between the explanatory variables. However, these formulations failed to improve the goodness of fit over that of the model presented, and invariably produced insignificant coefficients for the interaction terms.

Table 2 displays the mean net ingredient cost for the 16 ACTAP categories of prescribed medicines, for which OTC substitutes were available, for both fundholders and non-fundholders. The categories are based on the indicated British National Formulary (BNF) drug classifications, and examples of medicines or conditions corresponding to each category are included in the table. The results are ordered by decreasing ratio of non-fundholders' to fundholders' mean expenditures. As is evident, fundholders' mean spending per patient is lower for all categories, significantly so in eight of the 16 cases (bivariate *t*-test at 5% significance). Non-fundholders' expenditures are, at the mean, 35% higher than those of fundholders.

## Discussion

It had been suggested in the literature that the impact of payment exemption or prepayment on prescribing decisions would be minimal because few GPs would bother to take the time to explain about OTC status to patients, check the relative prices of the two forms of medication, and confirm that the patient is exempt from, or had prepaid, the prescription charges.[9] The results in Table 1 nevertheless suggest that the number of items of OTC drugs prescribed does increase as the level of prepayment or exemption among patients increases. While this study cannot comment specifically on the mechanism that GPs use in reaching their prescribing decisions, it is plausible to argue that

**Table 1.** Descriptive statistics and regression results.

| Variable | Mean or proportion | SD | β | SE | P-value |
|---|---|---|---|---|---|
| Proportion of patients aged 65 years (%) | 19.11 | 4.64 | 0.030 | 0.011 | 0.008 |
| Proportion of list holding prepayment certificates (%) | 1.61 | 0.83 | 0.381 | 0.060 | 0.000 |
| Unemployment rate (%) | 8.13 | 3.30 | 0.047 | 0.017 | 0.008 |
| Fundholding? (1=yes, 0=no) | 18.1% | | -0.309 | 0.114 | 0.008 |
| Dispensing practice? (1=yes, 0=no) | 52.4% | | 0.273 | 0.119 | 0.024 |
| Constant | | | 0.663 | 0.230 | 0.005 |
| Adjusted r-squared | | | | 0.53 | |

**Table 2.** Mean prescribing expenditure (£) per 1000 ASTRO-PUs on selected items available without prescription, 1993–94.

| BNF code | Examples | Fundholders (1) | Non-fundholders (2) | Difference | P | (2)/(1) |
|---|---|---|---|---|---|---|
| 9.6; 9.7 | Vitamins and tonics | 13.6 | 38.3 | -24.7 | 0.03 | 2.82 |
| 3.8; 3.9; 3.10 | Inhalations, nasal decongestants and cough medicines | 19.0 | 35.8 | -16.8 | 0.08 | 1.89 |
| 4.6 | Nausea and vertigo treatments | 9.7 | 17.5 | -7.8 | 0.00 | 1.80 |
| 2.6.1/3/4; 2.12.0 | Nitrates, vasodilators and lipid-lowering drugs | 248.5 | 403.9 | -155.4 | 0.02 | 1.63 |
| 9.1.1.1; 9.2.1; 9.5 | Oral fluids and minerals | 132.4 | 207.6 | -75.2 | 0.07 | 1.57 |
| 10.3.2 | Rubefacients | 57.3 | 84.9 | -27.7 | 0.02 | 1.48 |
| 4.7.1/4 | Analgesics | 80.3 | 118.7 | -38.4 | 0.02 | 1.48 |
| 5.4.1; 5.5.1 | Antiprotozoal and anthelmintic drugs | 4.2 | 5.9 | -1.7 | 0.15 | 1.41 |
| 10.1.1 | Non-steroidal anti-inflammatory drugs | 130.8 | 181.5 | -50.6 | 0.01 | 1.39 |
| 1.1; 1.2 | Antacids and antispasmodics | 148.3 | 193.0 | -44.7 | 0.02 | 1.30 |
| 13 | Skin preparations | 229.9 | 285.6 | -55.6 | 0.05 | 1.24 |
| 3.1.3; 3.4.1 | Theophylline and antihistamines | 149.9 | 183.0 | -33.1 | 0.09 | 1.22 |
| 7.3.2/3 | Contraceptives | 34.4 | 39.0 | -4.5 | 0.36 | 1.13 |
| 1.4; 1.6; 1.6; 1.9 | Laxatives, antidiarrhoea drugs and haemorrhoid treatments | 229.0 | 250.2 | -21.2 | 0.41 | 1.09 |
| 12 | Ear, nose and oropharynx preparations | 105.9 | 113.9 | -8.0 | 0.57 | 1.08 |
| 11.8 | Ophthalmic preparations | 14.9 | 15.7 | -0.8 | 0.72 | 1.05 |
| | Total | 1608.1 | 2174.3 | -566.2 | 0.00 | 1.35 |

GPs must, in some fashion, be accounting for the relative costs of medication available to patients in order for such a result to be obtained. The predicted result for dispensing status was also obtained. Again, the precise decision-making mechanism employed by GPs cannot be identified from the analysis, except to note that the finding is consistent with our earlier behavioural hypotheses.

The results displayed in Tables 1 and 2 indicate that fundholders in Lincolnshire prescribe significantly fewer, and spend significantly less on items otherwise available OTC. It is conceivable that this disposition might be related to the different financial incentives facing the two groups. As a consequence of recommending OTC medicines in place of issuing the corresponding prescriptions, fundholders would be able to effect savings in the prescribing component of their cash-limited practice budgets. For non-fundholding practices, savings from the indicative prescribing budget would be nominal rather than real. Fundholders might, therefore, be expected to limit their prescribing expenditures, relative to those of non-fundholders, in instances in which OTC substitutes are available for patients to purchase.

This result needs to be assessed in a more general context however. We have already established that fundholders in Lincolnshire spend less, and prescribe fewer items per patient for medicines in general.[12] It is, therefore, possible that fundholders' cost-containment strategy with respect to the non-prescribing of OTC medicines is, in essence, no different from their strategy in all other prescribing areas. Juxtaposed against this argument, however, is the likelihood that, over time, fundholders quickly become victims of their own successes. Evidence strongly suggests that fundholders achieve high levels of prescribing efficiency quite rapidly, efficiency as judged by a number of the Audit Commission's criteria, for example, via the use of generics and monitoring using Prescribing Analysis and Cost data.[14,15] In consequence, their capacities to effect further economies in their prescribing budgets by these means become progressively exhausted. Limitations on prescribing OTC medicines thus offer a further option for securing cost economies.

It has been argued from anecdotal evidence that the actual financial savings resulting from limitations on prescribing OTC medicines are likely to be small.[9] For Lincolnshire in 1993–94, the mean number of ASTRO-PUs per fundholding practice was approximately 41 440. Had fundholders spent the same amount per 1000 ASTRO-PUs on OTC preparations as did non-fundholders, then, based on the data in Table 2, their prescribing costs would have been some £23 500 higher on average. In comparison with an average total prescribing expenditure per fundholding practice of around £734 000, this savings figure might certainly appear relatively small, at 3% of total prescribing expenditure. The figure is not insubstantial absolutely, however, and certainly not in comparison with fundholders' mean prescribing budget overspend of £1200 in 1993–94.

Our results from Lincolnshire suggest that the prescribing behaviour of fundholders and non-fundholders with respect to OTC medicines is demonstrably different. In addition, dispensing status and patients' exemption from, or prepayment of prescription charges generate the predicted effects on OTC prescription. Two caveats remain to be noted. First, our five variables taken together explain just over half the variance in the outcome variable. Clearly, further, as yet unidentified factors exist in explaining variations in OTC prescribing: possibly these are more subtle and are related to the individual GP's notion of how patients' health needs ought to be managed. Secondly, the analysis has been conducted on a dataset specific to one health authority, and one that recorded one of the highest prescribing costs per patient in England.[16] Whether or not our findings may be generalized will only be demonstrated when more locality studies have been undertaken.

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